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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification: H04L 12/22, G06F 17/60, G07F 7/10, H04M 15/00	A1	(11) International Publication Number: WO 00/25477
		(43) International Publication Date: 04 May 2000 (04.05.2000)

(54) Title: PROCEDURE AND SYSTEM FOR IDENTIFYING AND BILLING A SUBSCRIBER ASSOCIATED WITH A SERVICE IN A TELECOMMUNICATION SYSTEM

(54) Titre: PROCEDE D'IDENTIFICATION D'ABONNE ET DE FACTURATION D'UN SERVICE DANS UN SYSTEME DE TELECOMMUNICATIONS ET DISPOSITIF CORRESPONDANT

(57) Abstract

The present invention relates to telecommunication systems. The object of the invention is to disclose a procedure and a system for identifying and billing a subscriber associated with a service in a telecommunication system. In the procedure, the parameters associated with the service are selected by means of a second telecommunication terminal (5), which preferably is a computer connected to the Internet. Based on the parameters, a unique identifier associated with the service is generated. The identifier contains e.g. a component specifying the service and an unambiguous running numeric component. According to the invention, a message of a given format is sent by means of the first telecommunication terminal to the billing server (6) over the first telecommunication network (1) and the sender of the message is billed in accordance with the normal subscriber invoicing practice of the first telecommunication network (1).

(57) Abrégé

Cette invention, qui a trait à des systèmes de télécommunications, concerne un procédé d'identification d'abonné et de facturation d'un service dans un système de télécommunications et le dispositif correspondant. Dans le cadre de ce procédé, les paramètres associés au service sont sélectionnés par un second terminal de télécommunications (5) qui est, de préférence, un ordinateur raccordé à l'Internet. Un seul identificateur associé au service est produit d'après ces paramètres. Cet identificateur contient, par exemple, une composante précisant le service et une composante numérique non ambiguë d'exécution. Un message d'un format donné est envoyé par le premier terminal de télécommunications au serveur de facturation (6) sur le premier réseau de télécommunications (1) et l'expéditeur du message est facturé conformément à la règle de facturation normale d'abonné du premier réseau de télécommunications (1).
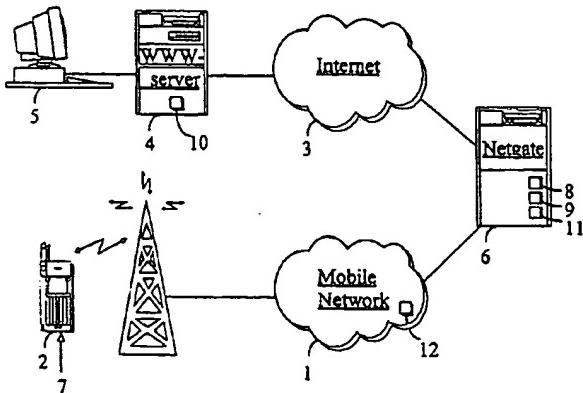
(54) Title: PROCEDURE AND SYSTEM FOR IDENTIFYING AND BILLING A SUBSCRIBER ASSOCIATED WITH A SERVICE IN A TELECOMMUNICATION SYSTEM

(57) Abstract

The present invention relates to telecommunication systems. The object of the invention is to disclose a procedure and a system for identifying and billing a subscriber associated with a service in a telecommunication system. In the procedure, the parameters associated with the service are selected by means of a second telecommunication terminal (5), which preferably is a computer connected to the Internet. Based on the parameters, a unique identifier associated with the service is generated. The identifier contains e.g. a component specifying the service and an unambiguous running numeric component. According to the invention, a message of a given format is sent by means of the first telecommunication terminal to the billing server (6) over the first telecommunication network (1) and the sender of the message is billed in accordance with the normal subscriber invoicing practice of the first telecommunication network (1).

Description

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Procedure and system for identifying and billing
a subscriber associated with a service in a
telecommunication system

FIELD OF THE INVENTION

5   The present invention relates to telecommuni-
cation systems. In particular, the present invention
concerns a procedure and a system for identifying and
billing a subscriber associated with a service in a
telecommunication system.

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BACKGROUND OF THE INVENTION

       Telecommunication systems are undergoing con-
tinuous development. People and enterprises using
telecommunication systems expect and assume that the
15   services provided in conjunction with telecommunica-
tion systems will go on improving and growing more
varied.

       The Internet is a global complex of different
telecommunication networks. Its basic idea is global
20   addressing that allows each individual computer con-
nected to it to be unambiguously located.

       At present, the Internet is very popular and
it is growing rapidly. There are Internet services
such as electronic mail and the WWW (World Wide Web).
25   Especially due to its ease of use and its world-wide
nature, the WWW has become a global channel for the
transmission of information.

       The Internet has gathered around it a new
channel for advertising and commerce. Various supple-
30   mentary services produced in the Internet   may be
chargeable. Examples of this are e.g. various net pub-
lications, real-time news services, etc. The means of
payment used include e.g. credit cards and electronic
money. A condition for the implementation of services
35   is that the user of a service be reliably identified

so that the bill for the service is directed to the
right party. For these services to gain more wide-
spread popularity, security of communication in dif-
ferent telecommunication systems must be guaranteed.

5   An implementation associated with chargeable supple-
mentary services is e.g. one in which the services are
based on separate systems built in WWW servers in
which a registered user of a service is identified on
the basis of a user identifier and a personal pass-

10   word. The identifier and password entered by the user
are compared with information stored in a user regis-
ter, and after successful identification the user is
given access to the actual service. The passwords may
be either permanent or changeable, being based e.g. on

15   lists of passwords or on agreed algorithms.

In the solution described above, a problem is
that the user identification system built in a WWW
server requires registration of service users, a sepa-
rate database, customer management and password man-

20   agement. The TCP/IP protocol (TCP, Transport Control
Protocol; IP, Internet Protocol) is susceptible to in-
terception, which means that at least static passwords
do not necessarily guarantee security. Moreover, the
billing of users for service transactions has to be

25   implemented via a separate billing system or alterna-
tively the service has to be integrated with an exist-
ing payment system in the Internet.

The object of the present invention is to
eliminate the drawbacks referred to above or at least

30   to significantly alleviate them.

A specific object of the invention is to dis-
close a new type of procedure and system for providing
services requiring reliable user identification for
mobile telephone subscribers, preferably GSM subscrib-

35   ers (GSM, Global System for Mobile communications)
over the Internet. Further, the invention allows the
billing for a service to be integrated with an exist-

ing mobile telephone billing system. This obviates the
need for implementing a separate user identification
and billing system.

As for the features characteristic of the
5   present invention, reference is made to the claims.

SUBJECT OF THE INVENTION

The procedure of the invention concerns iden-
tification and billing of a subscriber in conjunction
10 with a service in a telecommunication system. The sys-
tem of the invention preferably comprises a first
telecommunication network, a first telecommunication
terminal connected to the first telecommunication net-
work, and a second telecommunication network. Moreo-
15 ver, the system comprises a second telecommunication
terminal, which is connected to the second telecommu-
nication network. Furthermore, the system of the in-
vention comprises a telecommunication server connected
to the second telecommunication network and a billing
20 server connected to both the first and the second
telecommunication networks.

In the procedure of the invention, using the
second telecommunication terminal, a telecommunication
connection is established via the telecommunication
25 server to the second telecommunication network. This
means e.g. that a connection is set up via any service
provider to the second telecommunication network, e.g.
the Internet. The telecommunication server is prefera-
bly a WWW server. By means of the second telecommuni-
30 cation terminal, which is e.g. a computer, the user
selects a desired service, a possible second party as-
sociated with the service, the mode of service and
other parameters relating to the service. This is ac-
complished e.g. by selecting a HTML page (HTML, Hyper-
35 Text Markup Language) created for a given service.
From information supplied by the user and from possi-
ble attached information, an unambiguous identifier

associated with the service in question is formed. The
user sees the identifier e.g. on a new HTML page.

Based on the identifier received, using the
first telecommunication terminal, the user sends a
5   message of a given format to the billing server via
the first telecommunication network. A short message
is sent to a given predetermined short message number.
In practice, this means e.g. that, in the case of a
mobile communication network, the short message sent
10 is first passed to a short message service center
(SMS-C). The short message service center recognizes
by a given part of the short message that it has to be
sent further to the billing server. The short message
to be sent may also contain other information relating
15 to the service. The first telecommunication terminal
is preferably a mobile station and the first telecom-
munication network is correspondingly a mobile commu-
nication network. If the mobile communication network
is a GSM network, then the message to be sent is e.g.
20 a SMS message (SMS, Short Message Service).

The sender of the message and the service se-
lected by the sender are identified in the billing
server on the basis of the identifier contained in the
message sent. The information transmitted in the mes-
25 sage is sufficient for the identification of the user.
The sender of the message is identified e.g. on the
basis of the MSISDN number (MSISDN, Mobile Station In-
ternational ISDN Number) associated with an SMS mes-
sage. The billing for the selected service is part of
30 the business of the first telecommunication network.
According to the invention, the billing is done in ac-
cordance with normal subscriber invoicing. If the
first telecommunication network is a mobile communica-
tion network, then the user of the service is billed
35 in conjunction with a normal mobile communication in-
voice.

The sender of the message can be sent a con-
firmation of execution of the selected service. The
confirmation is sent e.g. as an SMS message or via a
WWW connection.

5   The system comprises means for performing the
functions described above.

The present invention has the advantage that
chargeable Internet services can be provided for WWW
users having a mobile telephone subscription, without
10   their having to register themselves in a separate
credit or digital cash system. The billing of service
users can be implemented via the billing system of an
existing mobile communication network, preferably a
GSM network, without a separate user database and cus-
15   tomer management.

LIST OF ILLUSTRATIONS

In the following, the invention will be de-
scribed in detail by the aid of a few embodiments,
20   wherein

Fig. 1 presents a system according to the
present invention, and

Fig. 2 presents a signalling flow diagram ac-
cording to the present invention.

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DETAILED DESCRIPTION OF THE INVENTION

The system illustrated in Fig. 1 comprises a
first telecommunication network 1, a first telecommu-
nication terminal 2 connected to the first telecommu-
30   nication network 1, and a second telecommunication
network 3. Further, the system of the invention com-
prises a telecommunication server 4 connected to the
second telecommunication network 3. Moreover, the sys-
tem comprises a second telecommunication terminal 5
35   connected to the second telecommunication network 3

and a billing server 6 connected to both the first 1
and the second 3 telecommunication networks.

The first telecommunication terminal 2 com-
prises means 7 for sending a message of a given format
5   on the basis of information contained in an identifier
via the first telecommunication network 1 to the bill-
ing server 6. The billing server 6 comprises means 8
for identifying the sender of the message and/or the
service associated with it in the billing server 6 on
10 the basis of the message and/or its sender and means 9
for billing the sender of the message in accordance
with the normal subscriber invoicing practice in the
first telecommunication network 1. Moreover, the bill-
ing server 6 comprises means 11 for sending to the
15 user of the service a confirmation of successful exe-
cution of the selected service in the form of an SMS
message and/or over the second telecommunication net-
work 3 via the telecommunication server 4 to the sec-
ond telecommunication terminal 5 and/or in some other
20 way.

The telecommunication server 4 comprises
means 10 for adding to the identifier associated with
the selected service a component identifying the serv-
ice and/or a unique transaction-specific identifier
25 and/or other information. In addition, the first tele-
communication network 1 comprises means 12 for direct-
ing a received message to the billing server 6 on the
basis of a predetermined identifier contained in the
message.

30   In an embodiment as illustrated in Fig. 1,
the user is sending an "electronic postcard". Using a
second telecommunication terminal 5 as presented in
Fig. 1, the user selects an appropriate HTML page in
the WWW, e.g. the HTML page of his own mobile communi-
35 cation network operator. This page presents him the
following alternatives: sending an electronic postcard
-   to a GSM subscriber on the basis of a GSM number,

- as an electronic mail message to a given electronic mail address,
- as a printed postcard to the receiver's home address.

5   The page also contains a list of service charges. On the next page, the user fills in on the electronic postcard a title, a greeting text and a receiver specification and attaches to the card a desired digital picture. Having filled in the informa-

10   tion relating to the postcard, the user confirms the transmission of the electronic postcard by means of a mobile telephone. For the transmission, the WWW server presents a new HTML page to the user. On this page, the user is asked to send a short message of a given

15   format e.g. to the abbreviated number 400. The text message of a given format may contain e.g. a message like "Card 4275". The user sends the above-described message to a certain abbreviated number, which in this example is 400. The short message service center SMS-C

20   of the mobile communication network directs the short message further to a server which handles short messages subject to a special charge; in the present example, this server is called Netgate. Generally, the text message of a given format contains a component

25   identifying the service (Service ID) and a unique transaction-specific identifier (Transaction ID). The transaction-specific identifier contains possible service options and an unambiguous identifier generated by the server.

30   Netgate identifies the service in question by the example word "Card" (Service ID) appearing at the beginning of the message and generates a billing ticket concerning use of the service. Based on the billing ticket, the charge for the service is debited

35   directly to the user in his mobile telephone invoice. Netgate transmits the numeric code "4275" (Transaction ID) and the user's mobile telephone number to an image

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server providing a WWW service. Based on these data,
the image server activates the transmission of the
card.

5   In the GSM network, the subscriber is identi-
fied by an effective authentication mechanism when a
telephone containing a SIM card (SIM, Subscriber Iden-
tity Module) connects to the GSM network. In the mo-
bile originated SMS message, the subscriber MSISDN
number, verified by the above-mentioned authentication
10   procedure, is transmitted to the short message service
center. In this example, the sender of the message is
identified by the MSISDN number.

The user receives an acknowledgement of re-
ceipt of the service request in the form of an SMS
15   message. If the transmission of the card is not acti-
vated, then the image server will delete unsent cards
after a certain delay. If the numeric code in the
short message is incorrect, then the user is given an
error message, e.g. "The card number you sent is in-
20   correct".

Fig. 2 presents a signalling flow diagram ac-
cording to the invention. It describes the operation
of the system of the invention, illustrating the com-
munication between the various components. MS is a mo-
25   bile station and "Netgate" is an example of a server
providing chargeable SMS services. The lozenges in
Fig. 2 represent internal processes or impulses in the
components.

The user supplies the information (20a) re-
30   quired in the service, producing an action request to
the WWW server (20). The WWW server interprets the in-
formation supplied and generates a unique transaction-
specific identifier (Transaction-ID) (21a) from it. At
the same time, it sends to the WWW-client a request
35   relating to the service, containing a component iden-
tifying the service (Service ID) and a unique transac-
tion-specific identifier (Transaction-ID). The request

also contains the short message number to which the
user is asked to send a text message.

Next, the user of the mobile station sends a
text message to the above-mentioned short message num-
5   ber (22). The text message contains a component iden-
tifying the service and a unique transaction-specific
identifier. The text message is first sent to the
short message service center (SMS-C) (23) of the mo-
bile communication network, which again is able to di-
10   rect it to a server taking care of specially charged
services. This server, which in this example is called
"Netgate", generates a billing ticket (23a) from the
service. In this example, the billing for the services
is performed in accordance with the normal billing
15   practice of the mobile communication network.

The server "Netgate" sends a notice about the
transaction performed to the WWW server (24). The no-
tice contains the billed MSISDN number and the trans-
action-specific identifier (Transaction-ID). The WWW
20   server recognizes the identifier sent and, based on
this, performs the actions (24a) comprised in the
service requested. The billing ticket CDR (CDR, Call
Detailed Record) generated from the service is sent to
the billing·system (25). A confirmation of the billing
25   transaction can be sent to the mobile station in the
form of an SMS message (26). The service user is sent
a confirmation of successful execution of the service
e.g. via the WWW connection (27) and/or as a SMS mes-
sage (28).

30   The invention is not restricted to the exam-
ples of its embodiments described above, but many
variations are possible within the scope of the inven-
tive idea defined in the claims.

Claims

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CLAIMS

1. Procedure for identifying and billing a
subscriber associated with a service in a telecommuni-
cation system comprising

5   a first telecommunication network (1),

a first telecommunication terminal (2), which is
connected to the first telecommunication network (1),

a second telecommunication network (3),

a telecommunication server (4), which is connected

10   to the second telecommunication network (3),

a second telecommunication terminal (5), which is
connected to the telecommunication server (4),

a billing server (6), which is connected to the
first and the second telecommunication networks (1,3),

15   said procedure comprising the steps of:

establishing a telecommunication connection by
means of the second telecommunication terminal (5) via
the telecommunication server (4) to the second tele-
communication network (3),

20   selecting by means of the second telecommunication
terminal (5) a desired service, a possible second
party associated with the service, the mode of service
and other parameters relating to the service,

generating on the basis of this information an un-

25   ambiguous identifier associated with the selected
service for the service user,

c h a r a c t e r i z e d   in that the proce-
dure comprises the steps of:

sending on the basis of the information contained

30   in the identifier a message of a given format to the
billing server (6) over the first telecommunication
network (1) by means of the first telecommunication
terminal (2);

identifying in the billing server (6) the sender

35   of the message and/or the service associated with the
message on the basis of the message and/or its sender;
and

billing the sender of the message in accordance
with the normal invoicing practice of the first tele-
communication network (1).

2. Procedure as defined in claim 1, c h a r -
5   a c t e r i z e d   in that a component identifying the
service and/or a unique transaction-specific identi-
fier and/or other information is added to the identi-
fier associated with the selected service.

3. Procedure as defined in claim 1 or 2,
10 c h a r a c t e r i z e d   in that the message sent to
the billing server (6) on the basis of the information
contained in the identifier by means of the first
telecommunication terminal (2) over the first telecom-
munication network (1) is sent in the form of an SMS
15 message.

4. Procedure as defined in any one of claims
1 - 3, c h a r a c t e r i z e d   in that the sender of
the message is identified in the billing server (6) on
the basis of the MSISDN number.

20   5. Procedure as defined in any one of claims
1 - 4, c h a r a c t e r i z e d   in that a confirmation
of successful execution of the service is sent to the
user of the service.

6. Procedure as defined in any one of claims
25 1 - 5, c h a r a c t e r i z e d   in that the confirma-
tion of successful execution of the selected service
is sent to the service user in the form of an SMS mes-
sage and/or over the second telecommunication network
(3) via the telecommunication server (4) to the second
30 telecommunication terminal (5).

7. Procedure as defined in any one of claims
1 - 6, c h a r a c t e r i z e d   in that the message
received in the first telecommunication network (1) is
directed to the billing server (6) on the basis of the
35 predetermined identifier contained in the message.

8. System for identifying and billing a sub-
scriber associated with a service in a telecommunica-
tion system comprising
a first telecommunication network (1),
5   a first telecommunication terminal (2), which is
connected to the first telecommunication network (1),
a second telecommunication network (3),
a telecommunication server (4), which is connected
to the second telecommunication network (3),
10   a second telecommunication terminal (5), which is
connected to the telecommunication server (4),
a billing server (6), which is connected to the
first and the second telecommunication networks (1,3),
said procedure comprising the steps of:
15   establishing a telecommunication connection by
means of the second telecommunication terminal (5) via
the telecommunication server (4) to the second tele-
communication network (3),
selecting by means of the second telecommunication
20   terminal (5) a desired service, a possible second
party associated with the service, the mode of service
and other parameters relating to the service,
generating on the basis of this information an un-
ambiguous identifier associated with the selected
25   service for the service user,
c h a r a c t e r i z e d in that the system
comprises:
means (7) for sending on the basis of the informa-
tion contained in the identifier a message of a given
30   format to the billing server (6) over the first tele-
communication network (1) by means of the first tele-
communication terminal (2);
means (8) for identifying in the billing server
(6) the sender of the message and/or the service asso-
35   ciated with the message on the basis of the message
and/or its sender; and

means (9) for billing the sender of the message in accordance with the normal invoicing practice of the first telecommunication network (1).

9. System as defined in claim 8, c h a r -
5 a c t e r i z e d in that the system comprises means (10) for adding a component identifying the service and/or a unique transaction-specific identifier and/or other information to the identifier associated with the selected service.

10 10. System as defined in claim 8 or 9, c h a r a c t e r i z e d in that the billing server (6) comprises means (8) for authenticating the sender of the message on the basis of the MSISDN number.

11. System as defined in any one of claims 8
15 - 10, c h a r a c t e r i z e d in that the system comprises means (11) for sending a confirmation of successful execution of the selected service to the service user in the form of an SMS message and/or over the second telecommunication network (3) via the telecom-
20 munication server (4) to the second telecommunication terminal (5) or in some other way.

12. System as defined in any one of claims 8
- 11, c h a r a c t e r i z e d in that the system comprises means (12) for directing the message received
25 in the first telecommunication network (1) to the billing server (6) on the basis of a predetermined identifier contained in the message.

13. System as defined in any one of claims 8
- 12, c h a r a c t e r i z e d in that the first tele-
30 communication network (1) is a mobile communication network.

14. System as defined in any one of claims 8
- 13, c h a r a c t e r i z e d in that the second telecommunication network (3) is the Internet.

35 15. System as defined in any one of claims 8
- 14, c h a r a c t e r i z e d in that the first tele-communication terminals (2) is a mobile station.

16. System as defined in any one of claims 8 - 15, c h a r a c t e r i z e d in that the second telecommunication terminal (5) is a computer.

17. System as defined in any one of claims 8 - 16, c h a r a c t e r i z e d in that the telecommunication server (4) is a WWW server.
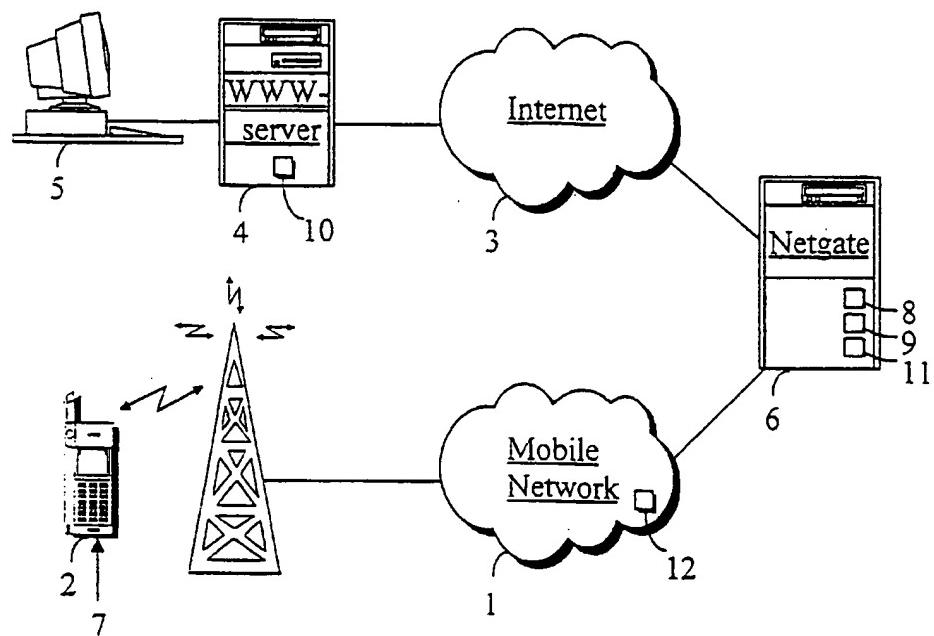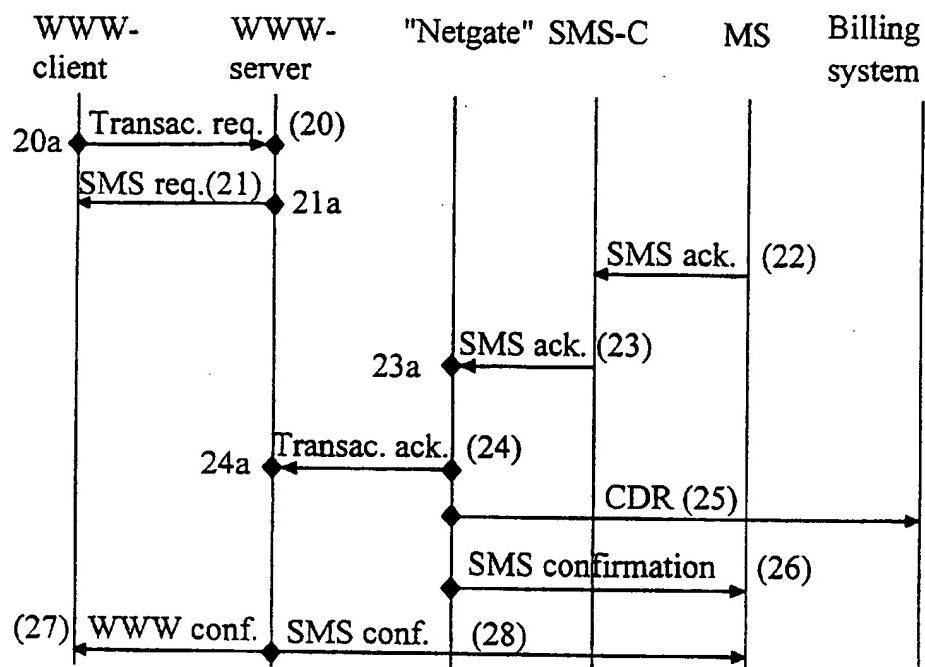
Fig. 1

Fig. 2

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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04L 12/22, H04M 15/00, G06F 17/60, G07F 7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F, G07F, H04L, H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 9901990 A2 (SONERA OY), 14 January 1999 (14.01.99), page 3, line 10 - page 4, line 10; page 5, line 27 - page 6, line 30, figure 1	1,7,8,12-17
P,Y		3-6,10,11
	--	
Y	WO 9731306 A1 (NOKIA MOBILE PHONES LTD.), 28 August 1997 (28.08.97), page 4, line 18 - page 6, line 33, figure 2	3-6,10,11
	--	
A	CA 2161983 A1 (ASSAD, ELIAS), 3 May 1997 (03.05.97), see whole document	1-17
	--	

[X] Further documents are listed in the continuation of Box C.   [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 March 2000	0 4 -04- 2000

Name and mailing address of the ISA/	Authorized officer
Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Jenny Eriksson/cs Telephone No. + 46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00902

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9701920 A1 (TELECOM FINLAND OY), 16 January 1997 (16.01.97), page 2, line 5 - page 3, line 27; page 5, line 7 - page 6, line 5 --	1-17
A	WO 9637848 A1 (WALKER ASSET MANAGEMENT LIMITED PARTNERSHIP), 28 November 1996 (28.11.96), page 2, line 14 - line 27 --	1-17
P,A	WO 9930293 A2 (HELSINGIN PUHELIN OYJ - HELSINGFORS TELEFON ABP), 17 June 1999 (17.06.99), abstract -- ---------	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.
PCT/FI 99/00902

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO	9901990 A2	14/01/99	AU	7771798 A	25/01/99
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